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CC50 Home Grown Proteins

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ECONOMICAL PRODUCTION OF LIVESTOCK

and livestock products cannot be [illegible] without an adequate supply of high-protein feeds. On many farms the rations fed to livestock are deficient in protein. On most farms the production of [illegible] carbonaceous feeds outbalances that of feeds [illegible] relatively high protein content. There is a strong tendency on these farms to feed the materials on hand and to refrain from the expenditure of cash for protein concentrates. As a result the feeds used do not give the most economical returns. Greater attention to the production of a balanced feed supply means less waste of feed materials and greater production of livestock and livestock products per farm or per acre.

In considering some of the following suggested sources of home produced protein, attention should be given to the relative cost of home production as compared to the market price for equivalent feed.

On Nebraska farms, pastures or range and alfalfa hay constitute the primary sources of home-grown proteins. Where these can be provided in sufficient amounts, the protein needs of roughage consuming livestock can be largely, if not entirely, satisfied. Although pasture and alfalfa hay provide an important source of protein for hogs, these alone are inadequate. The hog does not have the capacity to consume sufficient quantities of these bulky materials to extract from them the amount of protein necessary for the most rapid and economical gains. These sources must be supplemented with protein feeds in a more concentrated form.

Although pastures and alfalfa hay are likely to continue as the primary source of home-grown proteins, there are a number of other sources that deserve important consideration. Some of these are as follows: alfalfa silage, sweet clover silage, small grain hay and silage, soybean silage, hay and grain, sudan hay and silage, and skim milk.

Pasture and Range

New grass shoots may contain from 15 to more than 20 per cent protein on a dry-weight basis. They are also high in vitamin content, and in minerals if grown on fertile soil. Since good pastures, once established, provide the cheapest source of protein, requiring little or no expenditure of labor for harvesting, storing, and feeding, extension of the grazing season to as many days as possible is highly desirable.

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Of the perennial grasses, brome is outstanding as a very early and a very late grass for the eastern half of Nebraska. For western Nebraska crested wheatgrass offers promise in this respect. Both these grasses can be expected to be more or less dormant during midsummer. Native grasses, at their best during this period, may be used most advantageously at that time. If native pasture is not available, sudan may be used. Planted about May 20 it will be ready for grazing early in July and from then until frost. Sudan is adapted to all parts of Nebraska, and is used more universally for temporary pasture than any other crop. It is not recommended where chinch bug infestation is heavy.

Winter rye may be used in all parts of Nebraska for early spring and late fall grazing. When soil moisture is abundant and after the crop is well established, it may carry as many as three to four animal units per acre for considerable periods.

Sweet clover, winter wheat, and spring small grain may also be used in season as supplemental pasture. Alfalfa is regarded as the best type of pasture for hogs because of its high nutritional value and its long grazing season.

Experiments conducted by the Nebraska Experiment Station have shown that good alfalfa hog pasture, if grazed throughout the entire season, may be worth $60 or more per acre in terms of corn and tankage saved. Alfalfa should not be grazed closely if best results are to be obtained. Light grazing with the expectation of obtaining a considerable amount of hay is recommended. Where alfalfa is not available, sudan or rape, makes a very good substitute except that in each case the grazing season is much shorter.

Alfalfa Hay

Under suitable conditions of soil and moisture no other crop in Nebraska produces a greater quantity of high-protein feed per acre than alfalfa. Nebraska soils are especially adapted to the production of alfalfa, being high in lime and other minerals necessary for maximum growth of this crop. Soil moisture is usually the limiting factor. Where soil moisture is plentiful, yields of from four to as many as six tons per acre may be produced annually.

Green leafy alfalfa hay may contain 15 per cent or more protein of a high degree of digestibility. It is highly palatable for all classes of livestock, including hogs. Seventy-five per cent of the protein in alfalfa hay is in the leaves. Badly weathered hay or that handled in a manner to cause the loss of leaves can be expected to have a protein content of less than 10 per cent and to be of low palatability. Alfalfa windrowed as soon as it is wilted, and stacked before it is thoroughly dry but without external moisture or weather damage, will make high quality green leafy hay.

Alfalfa Silage

The use of alfalfa silage is on the increase, particularly in regions where weather conditions interfere with the production of good-quality hay. Ensiling of alfalfa not only results in less waste of feed constituents but also preserves a greater quantity of vitamins.

Under Nebraska conditions the first cutting of alfalfa can be used more advantageously for silage than subsequent cuttings. The first cutting usually makes a coarser, less palatable hay, and where curing conditions are unfavorable, may lose much of its feed value. Quite limited amounts of feed constituents are lost when the crop is properly ensiled.

On a dry-weight basis the protein content of green alfalfa can be expected to average slightly higher than that of well-cured hay. Some of this may be lost in the ensiling process, but since other constituents are often reduced a greater amount, the actual percentage of protein in the ensilage may in some instances be higher than that in the green material used.

Although alfalfa, as it approaches maturity, will give greater yields per acre and will make ensilage of a somewhat higher quality than very immature alfalfa, it is usually wise to harvest the crop before the new shoots become long enough to be clipped by the mower.

Immature material high in protein usually makes a very low-quality, unpalatable silage unless it is balanced at the time of ensiling with highly carbonaceous material such as molasses, shelled or cracked corn, nearly mature sweet sorghums, etc. Blackstrap molasses used at the rate of 40 to 80 pounds per ton of green material is recommended for alfalfa. Cracked corn may be substituted and used at the same rate. Shelled corn may be used also. The amount used should probably be greater than that of cracked corn. A half-and-half mixture of alfalfa and nearly mature sweet sorghum or corn forage is suggested where these materials are available at the same time.

Harvesting of alfalfa for ensilage may be accomplished in three principal ways: (1) use of a special field cutter; (2) mowing, windrowing and loading on racks with a hay loader; (3) binding with the grain binder, hauling with broad-tread, low-slung, heavy-duty trailer. Permitting the alfalfa to wilt slightly before it is hauled to the silo not only reduces the tonnage required to be handled, but usually results in a better quality of silage. When very green material is ensiled, there is often much loss of feed constituents through leakage of juices.

Sweet Clover Silage

Sweet-clover silage made from plants in full bloom has been found very satisfactory by many farmers for beef and dairy cattle. Yields of from 4 to 6 tons per acre have been reported. The protein content usually ranges in the neighborhood of 15 per cent. As with alfalfa and other materials, the percentage of protein in the plants

declines as they approach maturity. Unlike sweet clover hay, there have been no reports of "bleeding disease" resulting from the feeding of sweet clover silage.

The use of second-year sweet clover for silage on all farms where this crop is grown would seem to be a good practice. Too often this second year's growth is permitted to stand until time for the next crop, at which time it is burned to make possible the preparation of a good seedbed. This practice is a waste not only of valuable feed constituents but it destroys organic material needed by the soil. Where other pasturage is not available, sweet clover is, of course, used most economically by grazing.

Sweet clover ensilage is made in the same manner as alfalfa. Usually, sweet clover is bound with the grain binder since this greatly facilitates handling. Both horse-drawn and "power take-off" grain binders have been used successfully. Where sweet clover is cut for silage at the full bloom stage, somewhat less molasses or other material is necessary than is suggested for alfalfa. Sweet clover harvested at an earlier stage can be expected to contain a higher percentage of protein, and may require a greater amount of molasses or other preservative material.

Soybean Silage and Hay

Soybean hay or silage has a protein content about equal to that of alfalfa. As hay, soybeans require a longer curing period and thus may be subject to greater weather damage. They are ready to harvest for hay or silage when the pods are well filled but before the leaves begin to yellow and fall.

For hay they may be mowed, partially dried in the swath, and cured finally in the shock. The crop may also be cut with the grain binder, dried partially in the bundle, and finally in the shock. Under favorable conditions soybeans will yield from one to two tons of hay per acre. Considering production costs, soybean hay is usually more costly than alfalfa.

For silage, soybeans may be handled as alfalfa or sweet clover. Most commonly they are bound and ensiled immediately thereafter. Experimental studies indicate that soybeans require about 50 per cent more molasses or other comparable material for proper ensiling than does alfalfa. This may be due to the exceptionally high protein content of the beans proper. Soybeans can be mixed half and half with corn or sorghum since these crops are usually ready to ensile at the same time as soybeans.

Soybean Grain

Under favorable conditions in eastern Nebraska, soybeans can be expected to yield from 15 to 25 bushels of beans per acre. The beans contain about 36 per cent protein. Being high in oil, beans must be fed in limited amounts because of their laxative properties. Used judiciously, they are a valuable source of protein for sheep

and dairy and beef cattle. Hogs fed on soybeans produce soft pork, and hogs from territories where beans are commonly fed are, therefore, discriminated against on the market. The hog producer who has grown a crop of soybeans can best sell them to a processor and purchase soybean meal from which the oil has been extracted. Soybean meal is a good source of protein for hogs, especially if used in mixtures with protein of animal origin.

Small Grain Hay and Silage

Where alfalfa or other protein roughages are not available in sufficient quantities, consideration may be given to the small grains as a source of protein. Small grain cut at pre-bloom or early bloom stage can be expected to have a crude protein content of from 10 to 15 per cent. As the grain approaches maturity, the percentage of protein declines.

Many farmers are using considerable amounts of small grain hay, particularly in western Nebraska, where on dry land there is little or no alfalfa. In this area hay made from fall rye predominates. The feeding value of this hay is considered by these farmers as superior to prairie hay and as a satisfactory substitute for alfalfa, particularly for wintering livestock. Small grain mowed at the early bloom stage will yield fewer total feed units than if cut at a more mature stage. Where protein feed is scarce or high in price, however, a considerable sacrifice in total feed units is justified if a feed of high protein content is obtained. The feed units lost are largely carbohydrates, which, in the form of sweet sorghum fodder, can be produced quite cheaply and in an abundance often beyond immediate needs.

Where small grain has been damaged by storms, insects or rust, and where a profitable grain crop is unlikely, the crop may be used most economically for hay or silage. If harvested for silage at an immature stage, molasses or other similar material should be added to the green material in amounts somewhat less than needed with alfalfa. Small grain is best cut for silage at the early dough stage.

Sudan Hay or Silage

Experiments have shown that sudan, cut before the plants have headed, may have a protein content as high as 20 per cent or more under favorable curing conditions. When curing conditions are unfavorable, the percentage of protein can be expected to be considerably reduced. When growing conditions are favorable, more than one crop of hay may be harvested. Where other satisfactory protein feeds are not available and when the sudan cannot be profitably used for grazing, the use of sudan hay or silage as a source of protein for winter feeding might be considered. Immature sudan requires the same supplements as alfalfa if ensiled.

Small Grains

Both oats and barley are important sources of protein. Oats are especially valuable for growing animals and for work stock. Analyses of Spartan barley show it to be higher in protein than the other types commonly grown. Analyses of certain samples of the 1941 barley crop from different sections of the state showed the Spartan variety to have a protein content ranging from 15 to 18 per cent.

Need for Additional Protein Concentrates

It should be kept in mind that the entire protein needs of all classes of livestock cannot usually be satisfied by home-grown proteins alone. This is particularly true in the case of high-producing dairy cows. It also applies to hogs, which require more concentrated feeds, and which usually make more economical gains where part of the protein ration is of animal origin.

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